MERIT

Making Efficient + Responsible Investments In Transit

Capital Assistance - Program Prioritization

FY22 Technical Documentation

DRPT

Virginia Department of Rail and Public Transportation

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1.0 Capital Assistance Prioritization Process Overview

The Capital Assistance program is guided by a project prioritization process for capital needs that allows DRPT to allocate and assign limited resources into projects and investments identified as the most critical. The prioritization process is designed to favor projects that 1. Achieve the statewide policy objective of maintaining a state of good repair of existing assets, and 2. Have the greatest impact on the provision of public transportation services throughout the state. In addition, under this prioritization process, major capital investments are evaluated in terms of their potential benefits related to congestion mitigation, economic development, accessibility, safety, environmental quality, and land use.

Under the Capital Assistance program, projects are now classified, scored, and prioritized in the following categories:

1. ***State of Good Repair (SGR)****:* Projects or programs to replace or rehabilitate an existing asset.

2. ***Minor Enhancement (MIN):*** Projects or programs to add capacity, new technology, or a customer facility, and meet the following criteria:

    a. Total project cost: less than $2 Million; or

    b. Vehicle expansion of no more than 5 vehicles or 5% of the existing fleet size, whichever is greater. (Note: Increases in paratransit fleets to meet increasing service demands will be evaluated in the same manner as Minor Enhancements.)

3. ***Major Expansion (MAJ)****:* Projects or programs to add, expand, or improve service with a cost exceeding $2 million or, for expansion vehicles, an increase of greater than five vehicles or 5% of fleet size, whichever is greater.

Exemptions from prioritization scoring:

- Capital project types that do not receive any State transit capital funding contribution are exempt from the prioritization process entirely.

- Debt service agreements approved in previous fiscal years will be exempt from the scoring process. However, new requests for debt service payments will be scored as SGR projects based on the characteristics of asset to be replaced.

- Track lease payments and capital cost of contracting requests will also be exempt from the scoring process and evaluated as SGR of projects and programs.

1.1 Prioritization Process Framework

The capital assistance prioritization process begins by separating projects into the three categories listed above. Different criteria and scoring approaches have been determined for each capital project category (

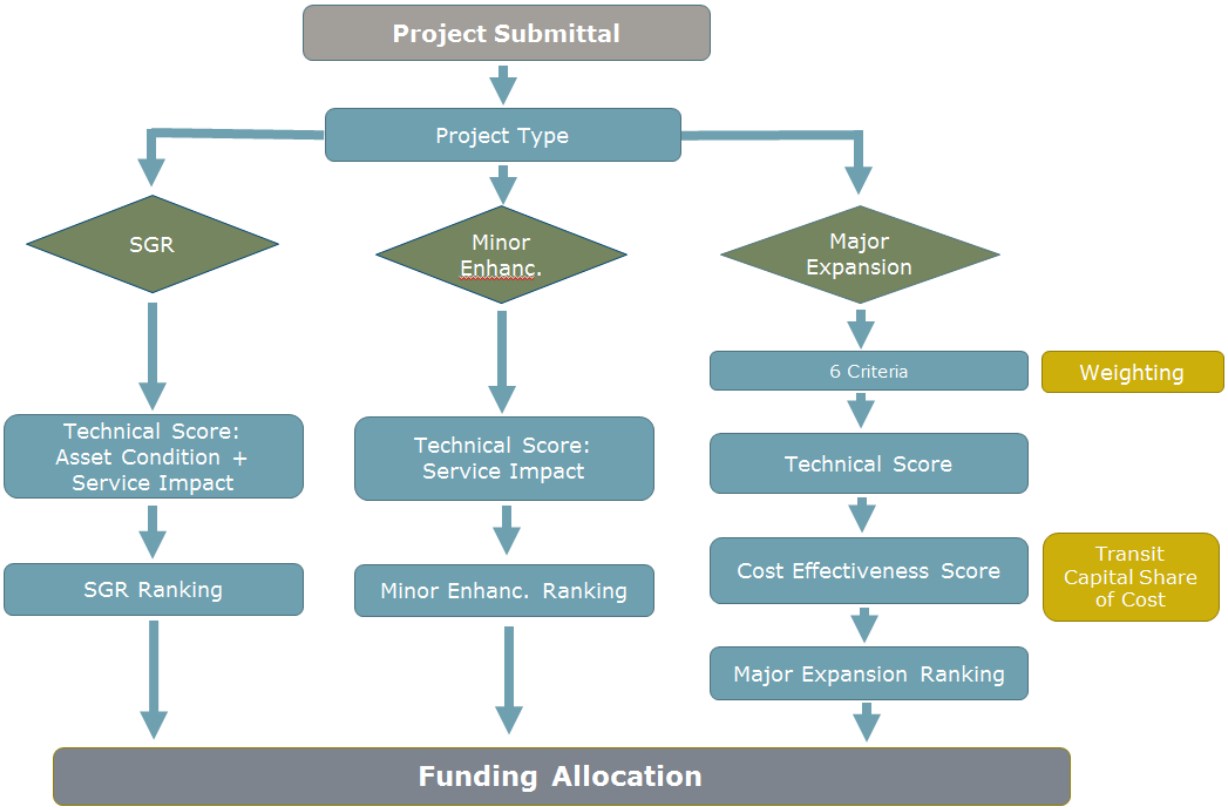
Figure 1.1). For example, State of Good Repair (SGR) projects are screened using asset condition and age data to determine whether there is a legitimate need for asset replacement or rehabilitation. Once an asset is

deemed “eligible,” the funding request is scored based on Asset Condition and Service Impact criteria. After all projects are scored, they are prioritized from highest to lowest.

The process to prioritize Minor Enhancement (MIN) projects scores each individual project based on service impact criteria. After scoring, similar to the SGR process, the minor enhancement applications are prioritized from highest to lowest score.

Finally, the process to score Major Expansion projects takes into account the six criteria required under House Bill (HB) 1359: congestion mitigation, economic development, accessibility, safety, environmental quality, and land use. Scoring is assigned by criterion and a total score is calculated by applying the selected weighting factors (weighting factors will be assumed to be the same as the SMART SCALE weighting type for that area—see Section 3 for more information). The technical score is then divided by the amount of State transit capital funding being requested for the project to calculate the cost-effectiveness score. Major expansion projects will be prioritized based on the cost-effectiveness score, resulting in a final list of prioritized projects.

Figure 1.1 Prioritization Process Framework



Projects will be prioritized for funding based on score and available funding for each project category separately. The Capital Assistance Program is structured to provide a minimum of 80% of the annual statewide capital allocation to State of Good Repair (SGR) and Minor Enhancement (MIN) projects with a maximum of 20% available for Major Expansion (MAJ) projects. Within the 80% reserved for SGR and MIN, 90% to 95% are reserved for SGR, and 5% to 10% are reserved for MIN projects. At the discretion of the Commonwealth Transportation Board, funding can move from MAJ to SGR if there is not sufficient funding available to meet SGR needs (but not from SGR to MAJ).

In order to provide predictability and to ensure projects are funded at a level sufficient to move forward, SGR and MIN projects will be matched at a maximum State match rate of 68% of total project cost. Major expansion projects will be funded at a maximum State match rate of 50% of total project cost, providing applicants with funding that can be leveraged against other State and Federal funding programs. Local matching funds, at a minimum of 4% of total project cost, are required for all transit capital projects.

1.2 Project Types

For the purposes of prioritization, project types were further defined in order to apply uniform scoring across projects with similar characteristics. Project scoring in the SGR category relies on both a documented asset age and an approved estimated service life (ESL) of the asset being requested for replacement. However, for many asset types that are eligible for funding under DRPT's capital assistance program, the state has not determined an approved ESL. For this reason, DRPT has determined a number of "Special Asset Categories," that will be scored and prioritized as MIN projects. These "Special Asset Categories" are listed below Table 1.1.

Table 1.1 provides examples of projects that fall into each of the three prioritization categories. For the purpose of the prioritization, project types were further defined for application of project scoring.

Table 1.1 Project Types for SGR, Minor Enhancement, and Major Expansion

State of Good Repair (SGR)	**Replacement/ Rehabilitation of:** • Vehicles/ rolling stock (buses, vans, rail cars, support vehicles, etc.) • Administrative/ maintenance facilities • Customer amenities (parking facilities, bus shelters, benches, signage) • Any other specific existing pieces of equipment and/or technology that do not fall into ***Special Asset Categories*****
Minor Enhancements (MIN)	**Investments in:** • Fleet expansion (less than 5 vehicles of 5% of fleet) • New customer amenities (parking facilities, bus shelters, benches, accessibility improvements, signage) • New equipment and technology • New small real estate acquisition • Capital project development less than $2 Million (engineering and design, construction management) • All assets that fall into ***Special Asset Categories**** *(incl. replacement/rehabilitation and new)*
Major Expansion (MAJ)	**Investments in:** • Construction of new fixed guideway corridor (heavy rail, light rail, bus rapid transit) • Construction of new administrative/ maintenance facility • Construction of new transit center, transfer center, or parking facility (more than $2 Million) • Major fleet expansion (more than 5 vehicles or 5% of fleet)

** **Special Asset Categories:**

- **Tools:** all tools needed to provide maintenance services (i.e. new/replacement tools, tool cabinets, etc.)
- **Maintenance Equipment:** all equipment needed to maintain vehicles, infrastructure, and/ or other assets (i.e. bus lift, tire mounting device, forklifts, etc.)
- **Spare Vehicle/ Rail Parts:** all spare vehicle and rail parts that will be used to maintain assets in working order that are not part of a larger rehabilitation project (i.e. alternators, transmissions, engines, rail track, seats, windows, gas tanks, etc.)
- **Building/ Facility Items and Fixtures:** all individual, small facility parts and fixture that are being replaced outside of a larger rehabilitation project (i.e. concrete floors, stairs, escalators, hand dryers, fans, lighting systems, etc.)
- **Grouped Assets/ Programs of Projects** (less than $2 million): includes large groups of assets that cannot be broken down into subcomponents (i.e. general "SGR" purchase of parts or track)
    - DOES NOT INLUDE: Grouped or Program of Project for vehicle rehab or replacement
- **Other Financial Tools**: includes funds for needed capital investments that cannot be scored as a replacement/ rehabilitation (i.e. capital cost of contracting, track lease payments, debt service on previously approved projects)

2.0 Scoring Methodology for SGR and MIN Projects

SGR projects (Figure 2.1) are evaluated considering asset condition (60 points) and service impact (40 points). The combined score from the two criteria adds up to 100 points. Minor enhancement projects (Figure 2.2) are prioritized solely on service impact considerations, with projects receiving up to 40 points.

Figure 2.1 SGR Project Scoring

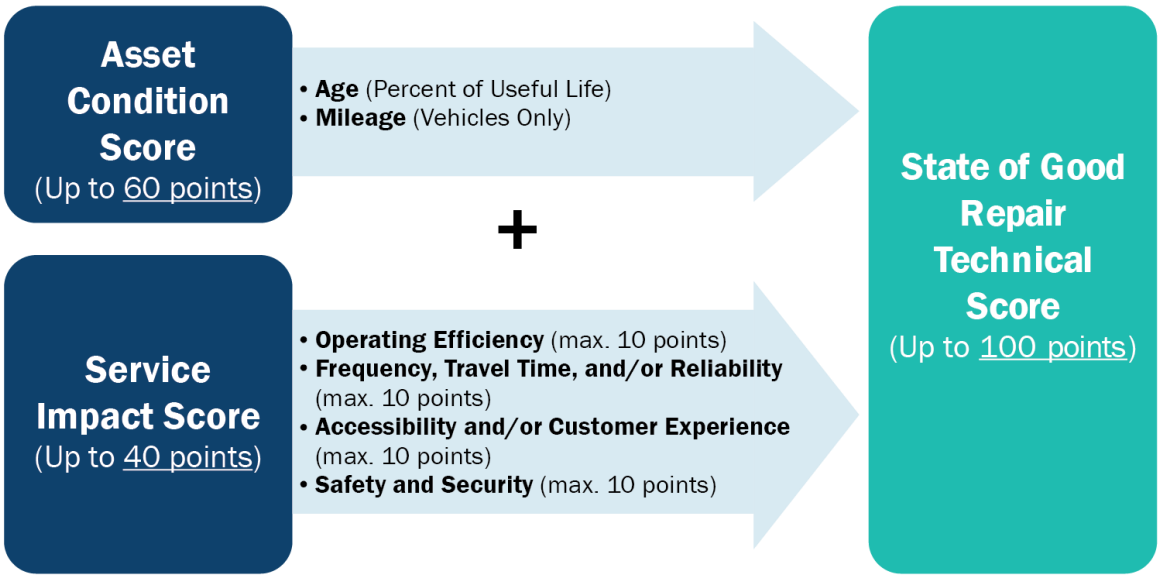
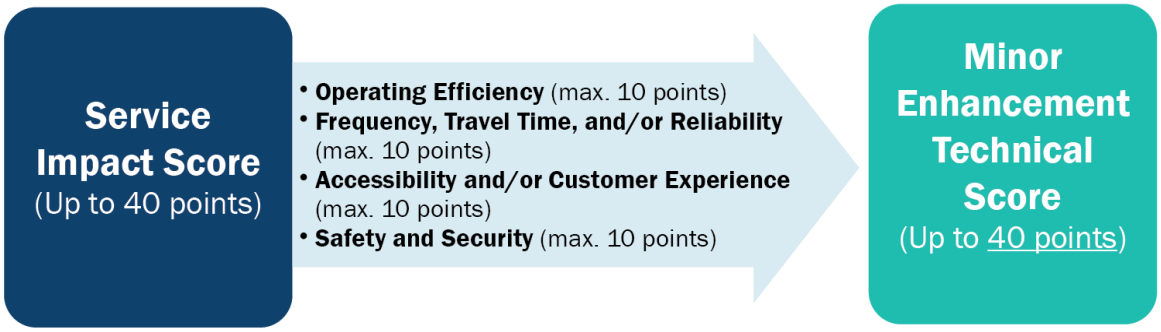


Figure 2.2 Minor Enhancement Project Scoring



2.1 Asset Condition Score

Projects are scored between 0 and 60, based on the asset age and mileage. Assets that are older or have higher mileage will receive higher scores.

The asset condition score is calculated based on the asset's age and mileage (reported in TransAM) at the time of application. For vehicles, the asset condition rating score is the average of the age and mileage-based scoring systems (50 percent mileage score and 50 percent age score). For non-vehicle assets, only the age score is used. Asset age and mileage are compared against the Expected Service Life (ESL), which is the FTA standard for minimum service life of that type of asset (FTA Circular 5010.IE). Note that each

individual vehicle that is being replaced receives a score, while nonvehicle assets with the same age ("in-service date") are expected to be rated as one project. If an entire facility is requested to be replaced or rehabilitated, it will be scored as one project as well.

Table 2.1 shows the resulting points based on the age and mileage (mileage applies to vehicles only). The scoring system is set so that assets well past ESL have higher scores than those which have just reached their useful life. This approach of rating the oldest assets highest may need to be revisited once the State backlog of SGR needs is addressed and it is possible to reward requests for assets to be replaced on their expected lifecycle.

Table 2.1 Age and Mileage Scoring

Age of Asset Relative to Service Life	Points	Mileage of Vehicle Relative to Service Life	Points
< 95% of ESL Age	0	< 95% of ESL Mileage	0
+/- 4.9% ESL Age	30	+/- 4.9% ESL Mileage	30
5-9.9% > ESL Age	35	5-9.9% > ESL Mileage	35
10-19.9% > ESL Age	40	10-19.9% > ESL Mileage	40
20-29.9% > ESL Age	45	20-29.9% > ESL Mileage	45
30-39.9% > ESL Age	50	30-39.9% > ESL Mileage	50
40-49.9% > ESL Age	55	40-49.9% > ESL Mileage	55
50% or more > ESL Age	60	50% or more > ESL Mileage	60

Vehicle rehabilitation projects (including midlife overhauls or repowers) are prioritized along with other vehicle assets; however, the asset condition score is calculated in a slightly different way. For a bus to quality for a midlife rehabilitation, it must meet 40% of ESL for either age or mileage, and the proposed modifications must extend the estimated service life (ESL) of the vehicle by at least 4 years. To calculate the asset condition score, each eligible bus receives 30 points if it meets or exceeds 40% of ESL for age, and 30 points if it meets or exceeds 40% of ESL for mileage. These two scores are averaged to determine a final asset condition score. Documentation of the planned modification must be provided demonstrating the expected extension in service life. Once the modification is complete, TransAM must be updated to reflect the new estimated service life (ESL) of the vehicle which will be used to prioritize the replacement of the vehicle for funding.

In the future, the asset condition score may be calculated or adjusted based on the observed asset condition. FTA has developed an asset condition rating from 1 (worn) to 5 (excellent) scale that can be used to rate the asset condition. Currently, TransAM does not include this observed asset condition data consistently for all agencies but this approach may be revisited when consistent condition data has been compiled statewide.

2.2 Service Impact

Service impact considers the asset impact on service (direct or indirect), and to what extent an asset affects the rider experience. Measuring service impact in this way is a qualitative exercise, assigning points based on the determined level of impact to service quality by project subtype. There are four sub-criteria under service impact which can each receive up to 10 points (40 points total):

- *Service Frequency, Travel Time and Reliability*.
- *Operating Efficiency*.
- *Service Accessibility and/or Customer Experience*.
- *Safety and Security*.

The definitions of each of the criteria are shown in Table 2.2.

Table 2.2 Service Impact Criteria

Criteria	Definition
Operating Efficiency	Provides for significantly more cost-effective provision of service
Frequency, Travel Time and/or Reliability	Speeds up transit routes or allows for increased frequency. Significant impact on reliability either through preventing breakdowns or removing vehicles from mixed traffic
Accessibility and/or Customer Experience	Significant improvement in a customer's ability to access the system or a significant improvement in the ease of use of the system.
Safety and Security	Provides a significant improvement in safety or security

Table 2.3 provides the default rating by criteria for each project type (using project types defined in TransAM). Default ratings were initially set by the project team based on alignment of the asset type with achievement of each of the service impact criteria (Table 2.4).

Points are assigned initially based on the default rating for each criterion:

- High = 8
- Medium = 5
- Low = 2
- No Impact = 0

Projects automatically receive the minimum score for the criteria based on the default values for each impact level. For example, a project ranked as high impact for the operating efficiency criterion would automatically receive 8 points for the criterion.

In order to differentiate and quantify based on specific characteristics of a project, the following additional considerations (Table 2.5) are utilized to adjust the default score. Points for each of the criteria are not to exceed 10 points. After adding any additional points earned for that project, points for all four criteria are summed to determine the Service Impact Score for that project, with a maximum of 40 points available.

Table 2.3 Default Service Impact Ratings by Project Type

Primary Project Types	Secondary Project Types	Operating Efficiency	Frequency, Travel Time and/or Reliability	Accessibility and/or Customer Experience	Safety and Security
Admin/Maintenance Facilities	All	Medium Impact	Medium Impact	Low Impact	Medium Impact
Customer Facilities	Bus Stop/ Shelter Improvements	Low Impact	No Impact	High Impact	Medium Impact
Customer Facilities	Transit Centers/Stations	Medium Impact	Medium Impact	High Impact	Medium Impact
Maintenance Equipment & Parts	All	Medium Impact	Medium Impact	Medium Impact	High Impact
System Infrastructure	All	High Impact	Medium Impact	Medium Impact	Medium Impact
Technology/Equipment	Administrative	Low Impact	Low Impact	Low Impact	Low Impact
Technology/Equipment	Operations Support	Medium Impact	Medium Impact	Medium Impact	Medium Impact
Technology/Equipment	Onboard Systems—ITS/Communications	Medium Impact	Medium Impact	High Impact	Medium Impact
Technology/Equipment	Onboard Systems—Safety	No Impact	No Impact	Medium Impact	High Impact
Vehicles	Revenue Vehicles	High Impact	High Impact	High Impact	High Impact
Vehicles	Support Vehicles	Medium Impact	Medium Impact	Low Impact	Low Impact
Vehicles	Overhaul/Engine Replacement	High Impact	High Impact	Medium Impact	High Impact

Table 2.4 Explanation of Default Service Impact Ratings by Project Type

Primary Project Types	Secondary Project Types	Notes on Updated Ratings Table (A) Operating Efficiency; (B) Frequency, Travel Time and/or Reliability; (C) Accessibility and/or Customer Experience; and (D) Safety and Security
Admin/Maintenance Facilities	All	Medium ratings for A, B, and D because of impact of maintenance. Low impact on C because this is for admin/maintenance, not customer-facing facilities.
Customer Facilities	Bus Stop/Shelter Improvements	Includes shelters, parts, signage and graphics. Improvements to bus shelters could have a low impact on A due to reduced maintenance costs, no impact on B, high impact on C (direct impact), and medium impact on D because of improved waiting areas.
Customer Facilities	Transit Centers/Stations	Includes transit centers, stations and parking facilities. Compared with bus stop improvements, A is medium because transit centers have potential to save operating costs (route optimization), B is medium because parking facilities and stations have impact on travel times.
Maintenance Equipment & Parts	All	A, B, and C received a medium because of role in maintenance in all areas of service delivery. D received a high for safety benefits of maintenance, such as for maintenance inspection activities.
System Infrastructure	All	This category is for system facilities and infrastructure including transit ways, rail, power, utilities, etc. For service impact rating, this category will be used primarily for SGR, so emphasis is on lifecycle replacement and reducing maintenance costs. High for A, medium for other criteria.
Technology/Equipment	Administrative	Primarily for hardware, software, and equipment for administrative functions. Since these are support functions, received a low for all four categories because of indirect impact on service.
Technology/Equipment	Operations Support	Includes hardware and software that are used in operations such as dispatch, scheduling, etc. Received a medium rating across all four categories since it impacts all aspects of operations.
Technology/Equipment	Onboard Systems—ITS/Communications	This project type includes real-time customer information and AVL. Receives a high rating for C because of the direct customer benefit.
Technology/Equipment	Onboard Systems—Safety	This project type includes onboard cameras or other safety features (e.g., collision avoidance) that are purchased separately from a bus. Medium for C because of customer perception of safety and security. High for D because of direct safety impact.
Vehicles	Revenue Vehicles	Includes all revenue vehicles (fixed-route and paratransit). This is the only project type receiving a high rating on all four criteria. Revenue vehicles have the most direct and comprehensive impact on service delivery of any asset type.
Vehicles	Support Vehicles	Received a medium on A and B because of indirect impact on operations, and a low on C and D because these assets do not directly affect the customer.
Vehicles	Overhaul/Engine Replacement	Slightly lower rating than for revenue vehicle. Received a medium for C because this has less of a direct impact on customer experience.

Table 2.5 Service Impact—Additional Scoring Considerations

Criteria	Additional Considerations Added to Default Score (Not to Exceed 10 points for Any Criterion)
Operating Efficiency	• Add 1 point for LEED-certified buildings or facilities (reduced facility operating costs). • Add 1 point for Electric or Hybrid Technology vehicles • Add 1 point for expansion buses if the agency spare ratio is below 15%
Service Frequency, Travel Time and Reliability[1]	• Add 1 point if the agency fixed-route on-time performance (OTP) is greater than 80% • Add 1 point if the agency Vehicle Mean Distance between Failures > 10,000 miles
Service Accessibility and Customer Experience	• Add 1 point for investments that add new stops or expand service coverage • Add 1 point for software/hardware to provide real-time arrival information
Safety and Security	• Add 1 point for onboard technology to enhance passenger safety • Add 1 point for improved lighting or other crime prevention features • Add 1 point for pedestrian safety improvements

[1] Measures used for demand responsive service may differ from those used for fixed route, for example, percentage of missed trips could be used in place of on-time performance.

3.0 Scoring Methodology for Major Expansion Projects

For Major Expansion (MAJ) transit projects, six prioritization criteria are utilized to prioritize projects. These six measures are the same measures identified in Virginia's SMART SCALE legislation, which required the measures be quantifiable and objective and that the analysis of a project's benefits is relative to its cost.

The following MAJ prioritization factors (also found in Table 3.1) will be considered relative to the cost of the project for MAJ projects:

- Congestion mitigation.
- Economic development.
- Accessibility.
- Safety.
- Environmental quality.
- Land use.

Table 3.1 Major Expansion Prioritization Factors

Criteria	Objective
Congestion Mitigation	Reduce delay, improve transportation system reliability, and encourage transit use
Economic Development	Support existing economies and enhance opportunity for economic development
Accessibility	Enhance worker and overall household access to jobs and other opportunities, and provide multiple and connected modal choices
Safety	Address multimodal safety concerns and improve transit safety and security
Environmental Quality	Reduce emissions and energy consumption by providing modal choices, and minimize natural resources impacts
Land Use	Improve consistency of the connection between local comprehensive plans and land use policies with transit investments

The prioritization criteria within each of the six factor areas will be weighted differently by four area type categories (Table 3.2). The typology categories and weighting frameworks within existing MPO and PDC boundaries (Figure 3.1 and Table 3.3) were selected by the MPOs and PDCs and adopted by the Commonwealth Transportation Board as part of the SMART SCALE process. An MPO or PDC, in consultation with Transportation District Commissions (where applicable) may request that the Commonwealth Transportation Board approve a different typology for the purpose of Transit Capital prioritization, by resolution of their policy board.

Table 3.2 Factor Weights by Category

Factor	Congestion Mitigation	Economic Development	Accessibility	Safety	Environmental Quality	Land Use
Category A	45%	5%	15%	5%	10%	20%
Category B	15%	20%	25%	20%	10%	10%
Category C	15%	25%	25%	25%	10%	
Category D	10%	35%	15%	30%	10%	

Figure 3.1 PDC—MPO Factor Weighting Typology Map

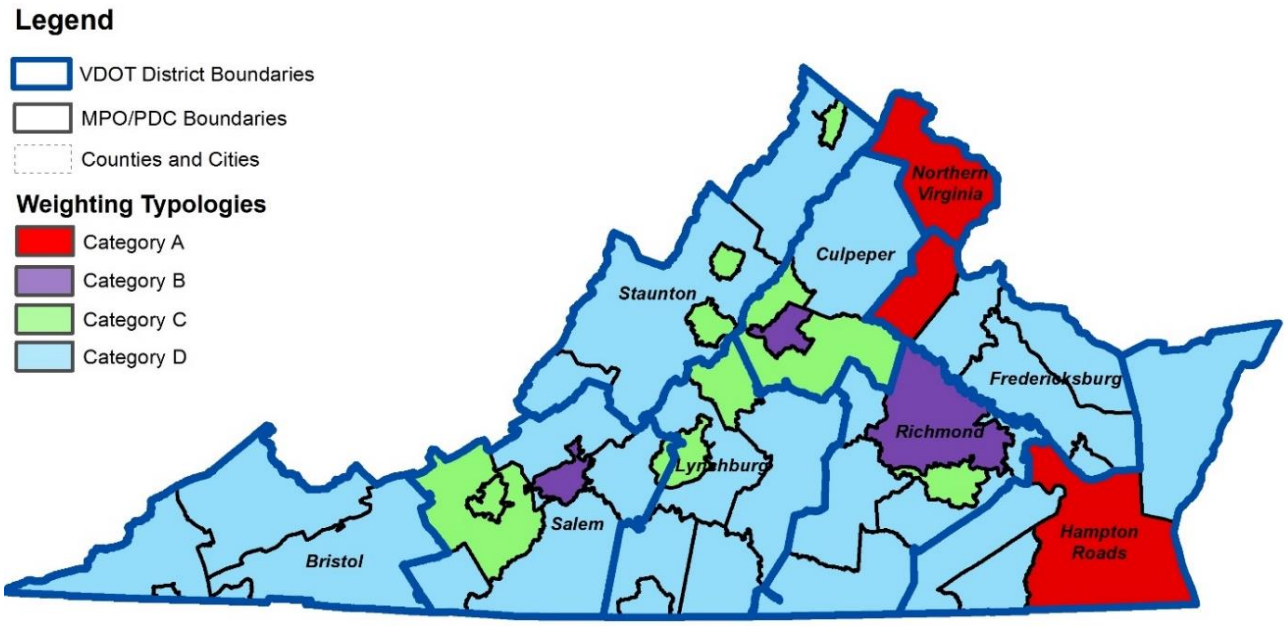


Table 3.3 PDC-MPO Factor Weighting Typology

Name	Typology
Accomack-Northampton PDC	Category D
Bristol MPO	Category D
Central Shenandoah PDC*	Category D
Central Virginia MPO	Category C
Charlottesville-Albemarle MPO	Category B
Commonwealth RC	Category D
Crater PDC*	Category D
Cumberland Plateau PDC	Category D
Danville MPO	Category D

Name	Typology
Fredericksburg Area MPO (FAMPO)	Category A
George Washington RC[1]	Category D
Hampton Roads PDC[a]	Category D
Hampton Roads TPO (HRTPO)[a,b]	Category A
Harrisonburg-Rockingham MPO	Category C
Kingsport MPO	Category D
Lenowisco PDC	Category D
Middle Peninsula PDC[b]	Category D
Mount Rogers PDC[1]	Category D
New River Valley MPO	Category C
New River Valley PDC[1]	Category C
Northern Neck PDC	Category D
Northern Shenandoah Valley RC[1]	Category D
Northern Virginia Transportation Authority (NVTA)/ Transportation Planning Board (TPB)[c]	Category A
Rappahannock-Rapidan RC[c]	Category D
Region 2000 LGC[1]	Category D
Richmond Regional PDC[1]	Category D
Richmond Regional TPO (RRTPO)	Category B
Roanoke Valley TPO (RVTPO)	Category B
Roanoke Valley-Alleghany PDC[1]	Category D
Southside PDC	Category D
Staunton-Augusta-Waynesboro MPO	Category C
Thomas Jefferson PDC[1]	Category C
Tri-Cities MPO	Category C
West Piedmont PDC[1]	Category D
WinFred MPO	Category C

[1] PDC defined as the remainder of the region outside the MPO boundary. In many cases, these regions include partial counties. If a project is within the MPO boundary in a partial county, the project shall use the weighting associated with the MPO with the following exceptions:

[a] The portion of Southampton County and the City of Franklin within the Hampton Roads TPO boundary shall use the weighting associated with the Hampton Roads PDC.

[b] Glouchester County portion of HRTPO included within Middle Peninsula PDC typology.
[c] Fauquier County portion of TPB included within Rappahannock-Rapidan RC typology.

For projects that cross multiple typology boundaries, the project shall use the weighting associated with the typology for which the majority of the project is located.

The selected prioritization measures for each of the six factor areas are displayed in Table 3.4. The detailed methodology on calculating these is described in the sections below.

Table 3.4 Prioritization Measures for Major Expansion Projects

Factor	Measure	Measure Weight
Congestion Mitigation	Change in peak-period transit ridership attributed to the project	100%
Economic Development	Project consistency with regional and local economic development plans and policies, and support for local development activity	100%
Accessibility	Project improvement in accessibility to jobs, workforce development, and select non-work destinations	50%
	Disadvantaged population (low-income, minority, or limited English proficiency) within walking distance of project	50%
Safety	Project contribution to improving safety and security, reducing risk of fatalities or injuries	100%
Environmental Quality	Reduction in daily vehicle miles traveled resulting from project	100%
Land Use	Transit supportive land use served by the project	100%

3.1 Congestion Mitigation

The congestion mitigation measure evaluates the increase in transit users the project accommodates. This projected increase in transit users will provide an alternative to SOV travel and a potential reduction of congestion in the project area.

Peak-Period Transit Riders Impacted	
Objective	Assess the potential benefit of the project in increasing the number of transit users served, providing an alternative to SOV travel and providing increased person throughput
Definition	Change in peak-period transit system ridership attributed to the project

Methodology

This measure is a quantitative analysis that requires an estimate of the projected change in peak-period ridership, or difference between the existing A.M. peak period ridership and the future 2030 peak period ridership attributed to the project. The change in ridership accounts for both new transit trips (e.g. those who diverted from auto to transit) as well as anticipated increases in ridership due to future population and employment growth between the existing year and 2030 in the project area. The measure is calculated based on the 10-year forecast (2030) for a.m. (three-hour) peak-period ridership to capture the impacts on congestion mitigation. If only daily forecasts are available, the daily forecast will be factored by the percentage of ridership occurring in the highest three-hour period. If the local agency does not provide a peak-period percentage, the default value will be 25% of daily ridership.

The change in peak-period ridership/users attributed to the project improvements will be estimated. This will vary by project type:

1. **Fixed-guideway (BRT/LRT) Corridor.** Project daily ridership forecast and peak-period ridership on the BRT or LRT line(s) will be requested as these are typically available from project ridership forecasts. Ridership for improvements to a section of a fixed guideway only includes the riders in the portion of the

route where the improvement (e.g. a dedicated bus lane) is proposed. This is typically a fraction of the total route ridership since not all riders travel on every segment.

2. **Fleet Expansion (Systemwide).** If fleet expansion vehicles will be used systemwide, peak transit ridership attributed to the vehicles will be estimated by calculating the current system daily ridership per vehicle in the fleet (daily passengers per vehicle). Peak ridership added = vehicles added * existing daily pass./vehicle * peak-period factor (percent of daily ridership) * 10-year growth.

3. **Fleet Expansion (Specific Routes).** If fleet expansion vehicles are tied to specific routes, the peak-period ridership that will be served by the new vehicles for that service will be requested. If an estimate of ridership is not available, the approach outlined for systemwide improvements will be used.

4. **Customer Facilities (Station Improvements)** Project daily ridership and peak-period ridership forecasts for the station will be requested. The effected ridership for a station improvement project includes both the boardings and alightings that occur at the station. If alighting information is not available, the boardings can be doubled to yield the total daily activity for the station. The portion of daily ridership occurring in the peak period is based on both boardings and alightings during the peak period. Ridership for a new station entrance that is part of an existing station is calculated based on the difference between the 10-year forecast and existing station ridership. Only the ridership associated with the proposed improvement is included (the ridership at the new entrance, not the total station ridership). Ridership for a new station entrance that is a part of a proposed station is equal to the 10-year forecast ridership (since there is no existing station ridership) and also only includes the ridership associated with the proposed improvement.

5. **Customer Facilities (Park & Ride).** For parking facilities, peak ridership will be assumed to be the number of spaces * utilization percentage in the peak period.

6. **Customer Facilities with System Impacts (Transit/Transfer Center).** For facilities that provide some benefit to multiple routes (and potentially to the entire system), future peak period ridership impacted by the improvement will be estimated and then factored to account for the scale of the improvement. For example, for a transfer facility that serves half of the bus routes in the system, provide the existing peak period ridership on those affected bus routes and apply growth factor to estimate future 2030 peak ridership. To account for the indirect impact on peak period ridership, one of two factors should be utilized:

   a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are “mission-critical” and service delivery depends on these systemwide tools; the change in systemwide peak period ridership should be factored by **10%**.

   b. Low Impact: For other improvements having an indirect impact on ridership, and not classified as a “high impact”, the change in systemwide peak period ridership should be factored by **5%**.

7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc.).** Future system ridership will be estimated based on existing system ridership. If the maintenance facility directly supports the addition of new service, the peak ridership on the new routes will be used. Otherwise, to account for the indirect impact on peak period ridership, one of two factors should be utilized:

a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are "mission-critical" and service delivery depends on these systemwide tools; the change in systemwide peak period ridership should be factored by **10%**.

b. Low Impact: For other improvements having an indirect impact on ridership, and not classified as a "high impact", the change in systemwide peak period ridership should be factored by **5%**.

8. **Technology/Information Systems**. Major investments in technology or information systems that are not part of a specific corridor, station, or facility (described above) should be scored as a systemwide improvement. Examples include customer information systems, such as real-time arrival information; operations systems, such as automatic vehicle location (AVL) systems; and administrative systems, such as fare payment or scheduling software. To account for the indirect impact on peak period ridership, one of two factors should be utilized:

a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are "mission-critical" and service delivery depends on these systemwide tools; the change in systemwide peak period ridership should be factored by **10%**.

b. Low Impact: For other improvements having an indirect impact on ridership, and not classified as a "high impact", the change in systemwide peak period ridership should be factored by **5%**.

Scoring Value

Difference between the existing A.M. 3-hour peak period ridership and the future 2030 3-hour peak period ridership attributed to the project

3.2 Economic Development

Project Support for Economic Development	
Objective	Assess if the project is supporting future economic development and the progress made toward development in the project corridor at the local level
Definition	Project consistency with regional and local economic development plans and policies and support for local development activity

Methodology

The focus of this measure is on support of planned transit-oriented development/redevelopment within the project corridor. Project assessment is based on the use of a checklist, which is shown in Table 3.5 below. Validation (a brief narrative) of the existence of the actions in the checklist is included as part of the project nomination. The project would be awarded points for each question and total points are summed with a maximum score of up to 5 points.

Table 3.5 Scoring Approach—Economic Development

Rating Description	Points Value
Transit project referenced in local Comprehensive Plan, local Economic Development Strategy or Regional Economic Development Strategy	Referenced in: 2.0 or consistent with: 1.0
2) Transit project located in an area of economic distress	Up to 1.0
3) Transit-Supportive Policies—Plans have been developed to increase corridor and station area development and/or enhance the transit-friendly character of corridor and station area development and/or improve pedestrian facilities	1.0
4) Supportive Zoning Near Transit—Zoning ordinances are in place that support increased development density in transit station areas and/or enhance transit-oriented character of station area and development and pedestrian access and/or and allow for reduced parking and traffic migration	1.0
	Total (maximum points in rows above) 5

Guidance for Questions 1 to 4 in Table 3.5

Question 1 Guidance: To determine whether a project is consistent with local Comprehensive Plan, local Economic Development Strategy or Regional Economic Development Strategy the project sponsor should conduct the following steps:

- **Step 1.** Identify the local Comprehensive Plan, local Economic Development Strategy or Regional Economic Development Strategy for the geographic area in which the transportation project is proposed (the strategy or goals may be found in a stand-alone document or as part of another document, such as a comprehensive plan).
- **Step 2.** Review the goals, objectives and strategies noted in the document(s).
- **Step 3.** Review the document to determine if the proposed transportation project is specifically cited in the document(s) as a key project desired to support local/regional economic development.
- **Step 4.** If the proposed transportation project is specifically mentioned as a key project in at least one of the local Comprehensive Plan, local Economic Development Strategy or Regional Economic Development Strategy documents, the project is considered "referenced in," and is awarded 2 pts.

Question 2 Guidance: To determine whether a project is located in an area of economic distress, consult the Economic Innovation Group's latest Distressed Communities Index by ZIP Code (ZIP Codes refer to U.S. Census Bureau ZIP Code Tabulation Areas). An interactive map is available at: https://eig.org/dci/2018-dci-map-u-s-zip-codes-by-state-map. Find the ZIP Code or Codes in which the transportation project is located or the service area supported by the project. Use the highest distress score and divide by 100. If the transportation project is located in a ZIP Code that does not have a distress score (Zip Codes with populations under 500 do not have a value calculated), then use the highest value adjacent ZIP Code and divide by 100. For systemwide projects, an *average* of the highest and lowest Distressed Community Index (DCI) values of Zip Codes within the project area buffer should be used to calculate the economic development score.

Question 3 Guidance: Transit-Supportive Policies: plans have been developed to increase corridor and station area development and/or enhance the transit-friendly character of corridor and station area

development and/or improve pedestrian facilities. For additional guidance on this question, refer to Federal Transit Administration, *Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects*, Section 4.1.2, August 2013. Systemwide improvements that do not have a direct land use impact would not qualify for a point under Question 3.

- **Step 1.** Identify local jurisdiction conceptual plans and policies that increase corridor and station area development at transit-supportive densities.
- **Step 2.** Identify local jurisdiction conceptual plans and policies that enhance transit-friendly character of the corridor and station area development.
- **Step 3.** Identify local jurisdiction conceptual plans and policies that improve pedestrian facilities, including facilities for persons with disabilities and parking policies in the corridor or station area.
- **Step 4.** If the project meets the criteria of step 1, 2, and/or 3, award one point.

Question 4 Guidance: Supportive Zoning Near Transit: zoning ordinances are in place that support increased development density in transit station areas and/or enhance transit-oriented character of station area and development and pedestrian access and/or allow for reduced parking and traffic migration. For additional guidance on this question, refer to Federal Transit Administration, *Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects*, Section 4.1.3, August 2013. Systemwide improvements that do not have a direct land use impact would not qualify for a point under question 4.

- **Step 1.** Identify adopted, or in the process of being adopted, local zoning ordinances that support increased development density in the project corridor transit station areas.
- **Step 2.** Identify adopted, or in the process of being adopted, local zoning ordinances that enhance transit-oriented character of station area development in the project corridor.
- **Step 3.** Identify adopted, or in the process of being adopted, local zoning ordinances that reduce parking and/or encourage traffic mitigation in the station areas in the project corridor.
- **Step 4.** If the project meets the criteria of step 1, 2, and/or 3, award one point.

Scoring Value

Scaling of Qualitative Measure: The qualitative rating will be factored/scaled by the change in forecasted jobs (year 2030 - existing) within walk distance of project. This is different from SMART SCALE approach which uses square feet of development in order to simplify calculation, and to incorporate revitalization/re-use of sites near transit.

The data source will be the Virginia statewide travel demand model land use inputs. Growth in jobs = year 2030 jobs - existing jobs, for the traffic zones within a project buffer. For traffic zones that are only partially within the project buffer, job totals are factored based on the portion of the traffic zone area that falls within the project buffer. The calculation of the job change will vary by project type:

1. **Fixed-guideway (BRT/LRT) Corridor.** The project buffer is defined as areas with ½ mile walking distance of the BRT or LRT line. The change in jobs will be calculated for traffic zones within the project buffer.

2. **Fleet Expansion (Systemwide).** For systemwide fleet expansion, the areas within ½ mile walking distance of all system routes will be included in the project buffer. The change in jobs will be factored by 10 percent to account for indirect benefits of systemwide fleet improvements and the significant impact of fleet expansion on frequency and reliability.

3. **Fleet Expansion (Specific Routes).** For fleet expansion that serves specific routes, the areas within ½ mile walking distance of the specific routes will be included in the project buffer. If the fleet expansion is for new service, the change in jobs within the buffer is used. If the fleet expansion is to support existing routes, the change in jobs will be factored by 10 percent to account for indirect benefits.

4. **Customer Facilities (Station Improvements)** The project buffer is defined as areas within ½ mile walking distance of the station. The change in jobs will be calculated for traffic zones within the project buffer.

5. **Customer Facilities (Park & Ride).** For new parking facilities, project buffer is defined as areas within ½ mile walking distance of the transit routes serving the Park & Ride lots. The change in jobs will be calculated for traffic zones within the project buffer.

6. **Customer Facilities with System Impacts (Transit/Transfer Center).** For customer facilities serving a large portion of the system routes, the areas within ½ mile walking distance of all supported routes will be included in the project buffer. If the transit center directly supports the addition of new service, 100 percent of the change in jobs within the buffer around the new routes will be used. Otherwise, to account for the indirect impact on job growth, one of two factors should be utilized:

    a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are “mission-critical” and service delivery depends on these systemwide tools; the change in jobs served by the system should be factored by 10%.

    b. Low Impact: For other improvements having an indirect impact on job growth, and not classified as a “high impact”, the change in jobs served by the system should be factored by 5%.

7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc).** For operational facilities, the areas within ½ mile walking distance of all system routes will be included in the project buffer. If the maintenance facility directly supports the addition of new service, 100 percent of the change in jobs within the buffer around the new routes will be used. Otherwise, to account for the indirect impact on job growth, one of two factors should be utilized:

    a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are “mission-critical” and service delivery depends on these systemwide tools; the change in jobs served by the system should be factored by 10%.

    b. Low Impact: For other improvements having an indirect impact on job growth, and not classified as a “high impact”, the change in jobs served by the system should be factored by 5%.

8. **Technology/Information Systems**. Major investments in technology or information systems that are not part of a specific corridor, station, or facility (described above) should be scored as a systemwide improvement. Examples include customer information systems, such as real-time arrival information; operations systems, such as automatic vehicle location (AVL) systems; and administrative systems, such as fare payment or scheduling software. To account for the indirect impact on job growth, one of two factors should be utilized:

   a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are "mission-critical" and service delivery depends on these systemwide tools; the change in jobs served by the system should be factored by 10%.

   b. Low Impact: For other improvements having an indirect impact on job growth, and not classified as a "high impact", the change in jobs served by the system should be factored by 5%.

3.3 Accessibility

3.3.1 Access to Jobs

A. Access to Jobs	
Objective	Measure improvement in accessibility to jobs and workforce development
Definition	Population that gains improved access to jobs and workforce development sites due to the transit project

Methodology

This measure assesses the average change in access to employment opportunities in the region as a result of project implementation. In order to simplify the calculation of this measure for transit agencies, this calculation does not require the use of a network-based model. Instead, the approach involves calculating three components of job accessibility:

- **Potential Users—**the population that gains better access to transit as a result of the project.
- **Potential Job Market Served**—the number of jobs that can be reached with the public transit service being improved.
- **Relative Time Improvement**—the approximate amount of time savings attributed to the transit project.

Each of these components is described in more detail below.

Potential Users

A GIS-based calculation will be made of the population that gains better access to transit as a result of the project. The data source will be the Virginia statewide travel demand model land use inputs for the year 2030. For traffic zones that are only partially within the project buffer, population totals are factored based on

the portion of the traffic zone area that falls within the project buffer. The calculation of affected population varies by project type:

1. **Fixed-guideway (BRT/LRT) Corridor.** The project buffer is defined as areas with ½ mile walking distance of the BRT or LRT line. The population will be summed within the project buffer.

2. **Fleet Expansion (Systemwide).** For systemwide fleet expansion, the areas within ½ mile walking distance of all system routes will be included in the project buffer. The population within the buffer will be factored by 10 percent to account for indirect benefits of systemwide fleet improvements and the significant impact of fleet expansion on frequency and reliability.

3. **Fleet Expansion (Specific Routes).** For fleet expansion that serves specific routes, the areas within ½ mile walking distance of the specific routes will be included in the project buffer. If the fleet expansion is for new service, the population within the buffer is used. If the fleet expansion is to support existing routes, the population within the buffer will be factored by 10 percent to account for indirect benefits.

4. **Customer Facilities (Station Improvements)** The project buffer is defined as areas within ½ mile walking distance of the station. The population will be summed within the project buffer.

5. **Customer Facilities (Park & Ride).** The project buffer is defined as areas within a 3-mile distance of the Park & Ride facility. The population will be summed within the project buffer. The potential users for Park & Ride facilities cannot exceed an amount that is five (5) times the number of new spaces being added at the facility.

6. **Customer Facilities with System Impacts (Transit/Transfer Center).** For customer facilities serving a large portion of the system routes, the areas within ½ mile walking distance of all supported routes will be included in the project buffer. If the transit center supports new service, the total population within the buffer of any new routes can be used. Otherwise, to account for the indirect impact on users, one of two factors should be utilized:

    a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are “mission-critical” and service delivery depends on these systemwide tools; the population served by the system should be factored by 10%.

    b. Low Impact: For other improvements having an indirect impact on job growth, and not classified as a “high impact”, the population served by the system should be factored by 5%.

7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc).** For operational facilities, the areas within ½ mile walking distance of all system routes will be included in the project buffer. If the facility supports new service, the total population within the buffer of any new routes can be used. Otherwise, to account for the indirect impact on users, one of two factors should be utilized:

    a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are “mission-critical” and service delivery depends on these systemwide tools; the population served by the system should be factored by 10%.

    b. Low Impact: For other improvements having an indirect impact on job growth, and not classified as a “high impact”, the population served by the system should be factored by 5%.

8. **Technology/Information Systems**. Major investments in technology or information systems that are not part of a specific corridor, station, or facility (described above) should be scored as a systemwide improvement. Examples include customer information systems, such as real-time arrival information; operations systems, such as automatic vehicle location (AVL) systems; and administrative systems, such as fare payment or scheduling software. To account for the indirect impact on users, one of two factors should be utilized:

    a. High Impact: For improvements that have either (1) a significant impact on service frequency, travel time and/or reliability; or (2) are "mission-critical" and service delivery depends on these systemwide tools; the population served by the system should be factored by 10%.

    b. Low Impact: For other improvements having an indirect impact on job growth, and not classified as a "high impact", the population served by the system should be factored by 5%.

Potential Job Market Served

A GIS-based calculation will be made of the job centers served that are made more accessible by transit as a result of the project. The data source will be the Virginia statewide travel demand model land use inputs for the year 2030. As shown in Table 3-7, job totals are grouped into three categories: greater than 40K, between 10K and 40K, and less than 10K. So the estimate of jobs served can be a rough approximation, rather than the more precise method used to calculate population totals. For traffic zones that are only partially within the project buffer, job totals are factored based on the portion of the traffic zone area that falls within the project buffer. The calculation of the jobs served will vary by project type:

1. **Fixed-guideway (BRT/LRT) Corridor.** The project buffer is defined as areas with ½ mile walking distance of the BRT or LRT line. The jobs served will be calculated for traffic zones within the project buffer.

2. **Fleet Expansion (Systemwide).** For systemwide fleet expansion, the areas within ½ mile walking distance of all system routes will be included in the project buffer. The jobs served will be factored by 10 percent to account for indirect benefits of systemwide improvements and the significant impact of fleet expansion on frequency and reliability.

3. **Fleet Expansion (Specific Routes).** For fleet expansion that serves specific routes, the areas within ½ mile walking distance of the specific routes will be included in the project buffer. If the fleet expansion is for new service, the jobs served within the buffer will be used. If the fleet expansion is to support existing routes, the jobs served will be factored by 10 percent to account for indirect benefits.

4. **Customer Facilities (Station Improvements**). If the station improvement allows users in the project station area to have greater access to jobs at nearby stations along the same fixed-guideway line/route served by the project station, such as access to the CBD, the job market served can be based on the total number of jobs served by the transit line. The project buffer is defined as areas within ½ mile walking distance of all stations served by the fixed-guideway line where the improved station is located.

5. **Customer Facilities (Park & Ride).** For parking facilities, the project buffer is defined as areas within ½ mile walking distance of the transit routes serving the Park & Ride facility. The jobs served will be calculated for traffic zones within the project buffer.

6. **Customer Facilities with System Impacts (Transit/Transfer Center).** For customer facilities serving a large portion of the system routes, the areas within ½ mile walking distance of all supported routes will be included in the project buffer. . If the transit center supports new service, the total jobs served within the buffer of any new routes can be used. Otherwise, to account for the indirect impact on users, one of two factors should be utilized (per the guidance listed above under "Potential Users"): the jobs served will be factored by either 10% (High Impact) or 5% (Low Impact).

7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc).** For operational facilities, the areas within ½ mile walking distance of all system routes will be included in the project buffer. . If the facility supports new service, the total jobs served within the buffer of any new routes can be used. Otherwise, to account for the indirect impact on users, one of two factors should be utilized (per the guidance listed above under "Potential Users"): the jobs served will be factored by either 10% (High Impact) or 5% (Low Impact).

8. **Technology/Information Systems**. Major investments in technology or information systems that are not part of a specific corridor, station, or facility (described above) should be scored as a systemwide improvement. Examples include customer information systems, such as real-time arrival information; operations systems, such as automatic vehicle location (AVL) systems; and administrative systems, such as fare payment or scheduling software. To account for the indirect impact on users, one of two factors should be utilized (per the guidance listed above under "Potential Users"): the jobs served will be factored by either 10% (High Impact) or 5% (Low Impact).

In addition to the potential job market, a consideration will be made of select non-work and workforce development sites that are accessed within ½ mile walking distance of the affected routes. Relevant non-work or workforce development sites include:

- Virginia Workforce Centers – One Stop Centers (www.elevatevirginia.org)
- Education - community colleges and universities (does not include primary and secondary schools)
- Healthcare - hospitals and medical clinics
- Public Services - government offices, library, post office, community center, court house, police station (does not include public outdoor recreation such as parks or pools).

Average Time Improvement

In order to measure an individual project's impact on accessibility, the average time savings attributed to the project (for a typical user) will be assessed by the type of project and used to factor the number of potential users. The time savings are expressed as the average time savings in minutes, relative to current transit service in the corridor/market. Time savings will be grouped into four categories:

- Greater than 10 minutes
- Between 0 and 10 minutes savings
- Reliability benefits only

- No time savings or reliability benefits

To estimate the rough time savings, the project should be evaluated in terms of impact on access time, wait time, and in-vehicle time (Table 3.6).

Table 3.6. Time Savings Calculation

Average Time Improvement	Calculation Approach
Walk Access Time	Improvement in walk access times to the stop/station, relative to existing transit service. Generally if new stops are added and can reduce walking distance by ½ mile, that equates to a 10-minute savings.
Drive Access Time	If Park& Ride facility is new, the time savings will be counted as greater than 10 minutes. If the project is an improvement to an existing Park & Ride facility, such as adding more spaces, the time savings will be counted as less than 10 minutes.
Wait Time	Calculated at one-half of the change in headways between new and existing service. Ex. If existing service operates every 30 minutes, and new service is every 15 minutes, wait time improvement is ½ of 15 minutes = 7.5 minutes.
In-Vehicle Time	Time savings due to improvements in transit speed (TSP, queue jumps, bus lanes) relative to existing bus service in the corridor.

The calculation of time savings will vary by project type:

1. **Fixed-guideway (BRT/LRT) Corridor.** For new transit service routes or rapid transit lines in a corridor, an estimate should be made of the average travel time savings relative to existing transit service in the corridor. This can include a combination of in-vehicle travel time (resulting from dedicated lanes or priority treatment), wait time improvements (1/2 the change in headway), or walk time improvements.

2. **Fleet Expansion (Systemwide).** For systemwide fleet expansion, time improvements should be based on any change in wait time due to additional service and lower headways. If fleet expansion does not improve travel time, only the reliability benefits will be considered.

3. **Fleet Expansion (Specific Routes).** If the fleet expansion is for new or more frequent service, an estimate should be made of the average travel time savings (combination of access, wait, or in-vehicle time) relative to existing transit service in the corridor. If the fleet expansion is to support existing routes without direct time savings, only reliability benefits will be included.

4. **Customer Facilities (Station Improvements).** For new rail stations or bus stops served by transit operating every 15 minutes or better, the time savings will be counted as greater than 10 minutes. If the project is an improvement to an existing stop or station, the time savings will be counted as less than 10 minutes.

5. **Customer Facilities (Park & Ride).** If Park& Ride facility is new, the time savings will be counted as greater than 10 minutes. If the project is an improvement to an existing Park & Ride facility, such as adding more spaces, the time savings will be counted as less than 10 minutes.

6. **Customer Facilities with System Impacts (Transit/Transfer Center).** Time improvements should be based on any change in wait time (due to lower headways) or transfer times. If travel time benefits are negligible, only reliability benefits will be included.

7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc).** If the operational facility directly supports new or more frequent service, an estimate should be made of the average travel time savings (combination of access, wait, or in-vehicle time) relative to existing transit service in the corridor. If the facility is to support existing routes without direct time savings, only reliability benefits will be included.

Scoring Value

Accessibility to jobs = Potential Users * Job/Non-Work Accessibility Factor (JAF) where the maximum value for JAF is 10 points using the inputs shown in Table 3.7. Note: Projects that have no time savings or reliability benefits receive a 0.

Table 3.7. Job Accessibility Factor

Average Time Improvement	Jobs Served < 10,000	Jobs Served Between 10,000 and 40,000	Jobs Served Greater than 40,000
Reliability Gain Only	1	2	3
Between 1 and 10 mins.	2	4	6
Greater than 10 min.	3	6	9
Additional Points for Non-Work Destinations (Max. of 3 additional points)	Virginia Workforce Development Centers		1 point for each
	Education - community colleges and universities		1 point for each
	Healthcare - hospitals and medical clinics		0.5 points for each
	Public Services - government offices, library, post office, community center, court house, etc.		0.5 points for each

3.3.2 Access to Disadvantaged Communities

B. Access to Disadvantaged Communities	
Objective	Measure change in transit accessibility for disadvantaged populations
Definition	Disadvantaged population (low-income, minority, or limited-English proficiency) that gains improved access due to the project

Methodology

The overall methodology for this measure follows the same basic steps as for “Accessibility to Jobs” measure described above with one significant difference:

- **Potential Disadvantaged Users**—the disadvantaged population that gains better access to transit as a result of the project.

For the purposes of this analysis, “disadvantaged population” is calculated as low-income, minority, or limited-English proficiency (LEP) population. The data source for total population will be the Virginia statewide travel demand model land use inputs for the year 2030. The percentage of disadvantaged population impacted by the project can be found using EPA’s EJScreen tool: https://ejscreen.epa.gov/mapper/. Rather than drawing the project using the EJScreen tool, GIS data can be downloaded from the EJScreen website and overlaid against project buffer shapefiles.

See the description of the methodology described in section 3.3.1 (Potential Users) for determining the project buffer for calculation of the affected disadvantaged population. The EJScreen tool will generate the percentage of Low Income, Minority, and LEP (“Linguistically Isolated”) population within the project buffer. Given that there is typically overlap between these three categories, the highest percentage of any one of these variable should be used. For example, if a project buffer shows 44% minority population, 16% low-income population, and 8% linguistically isolated population, the percentage of disadvantaged population will be set at 44%.

Scoring Value

Accessibility for disadvantaged population = Potential Users (Population * % of Low-Income, Minority, or LEP Population) * Accessibility Factor (AF), where the AF is calculated as shown in Table 3.8. Note: Projects that have no time savings or reliability benefits receive a 0.

Table 3.8. Accessibility Factor for Disadvantaged Population

Average Time Improvement	Accessibility Factor
Reliability Gain Only	1
Between 1 and 10 mins.	2
Greater than 10 min.	3

3.4 Safety

Expected Safety Benefit	
Objective	Evaluate the project’s contribution to improving safety and security and reducing the risk of fatalities or injuries
Definition	Assign points based on direct safety benefit

Methodology

The focus of this measure is on support of improvements to user, employee, and system safety. Project assessment is based on the use of a checklist, which is shown in Table 3.9. Validation (a brief narrative) of the existence of the actions in the checklist is included as part of the project nomination. The project would be awarded points for each question and total points are summed with a maximum score of up to 4 points.

There are four questions used to determine scoring for this criteria: project includes asset-condition related improvements, project includes technology-related improvements, project includes customer facility improvements, and project includes projects directly related to safety or emergency response.

Table 3.9 Scoring Approach—Safety

Project Characteristics	Points (If Yes)
1. Project includes asset-condition related (new major facilities or fleet expansion bringing down fleet age) improvements that could reduce risk of accidents	1
2. Project includes technology-related (cameras, crash-avoidance systems)	1
3. Project includes customer-facility improvements (waiting areas with lighting, pedestrian access)	1
4. Project includes projects directly related to safety or emergency response (transit police-related, fire prevention, etc.)	1
Total Points Possible	**4 points maximum**

Guidance for Questions 1-4 in Table 12:

Question 1 Guidance—Project includes asset-condition related improvements that could reduce the risk of accidents:

- **Step 1.** Provide documentation and an explanation of project improvements.
- **Step 2.** Provide documentation of the expected reduction in risk of accidents (data from studies on the asset, data from past projects implementing the same asset-condition improvements, etc.).
- **Step 3.** Award one point if the project provides an asset-condition related improvement that demonstrably reduces the risk of accidents to customers or staff.

Question 2 Guidance—Project includes technology-related safety improvements:

- **Step 1.** Provide documentation of purchase of safety-improving technology.
- **Step 2.** Provide an explanation of how the technology will improve safety, referencing data and studies if possible.
- **Step 3.** Award one point if the project includes technology-related safety improvements.

Question 3 Guidance—Project includes customer-facility improvements:

- **Step 1.** Provide documentation and an explanation of customer-facility improvements.
- **Step 2.** Provide documentation of the expected reduction in risk/increase in safety, referencing data and studies if possible.
- **Step 3.** Award one point of the project includes customer-facility improvements that demonstrably improve customer safety.

Question 4 Guidance—Project includes projects directly related to safety or emergency response:

- **Step 1.** Provide documentation and an explanation of the safety or emergency response related project.
- **Step 2.** Award one point if the project includes projects directly related to safety or emergency response.

Scoring Value

Scaling of Qualitative Measure. Safety points are scaled by daily transit person miles traveled served, calculated as: 2030 Daily Ridership on the project * Average trip length for transit passengers using the project.

The daily ridership and average trip length on the project will be requested from the applicant, or else estimated based on project type:

1. **Fixed-guideway (BRT/LRT) Corridor.** Project future daily ridership forecast on the BRT or LRT line(s) will be requested as these are typically available from project ridership forecasts. Average trip length should be based on forecasts, or else estimated based on the length of the corridor (default is to use ½ the length of the corridor).

2. **Fleet Expansion (Systemwide).** If fleet will be used systemwide, daily transit ridership attributed to the vehicles will be estimated by calculating the current system daily ridership per vehicle in the fleet (daily passengers per vehicle). Daily ridership = vehicles added * existing daily passengers/vehicle * 10-year growth. Average trip length will be the system average.

3. **Fleet Expansion (Specific Routes).** If fleet is tied to specific routes, the daily ridership that will be served by the new vehicles for that service will be requested. If an estimate of ridership is not available, the approach outlined for systemwide improvements will be used (for the specific routes). Average trip length will be the average for the selected routes.

4. **Customer Facilities (Station Improvements)** Project daily ridership forecasts for the station will be requested. Ridership should be associated with the proposed improvement – for example, a new station entrance would only count the ridership expected at the new entrance, not the total station ridership. Average trip length will be the system average, or the average for routes that serve the station. For this calculation, the effected ridership for a station improvement project includes both the boardings and alightings that occur at the station. If alighting information is not available, the boardings can be doubled to yield the total daily activity for the station.

5. **Customer Facilities (Park & Ride).** For parking facilities, daily ridership will be assumed to be the number of spaces * utilization percentage * 2 (reflecting commuting inbound and outbound). Average trip length should be based on the distance from the park & ride facility to the major destination (such as the CBD) for service that originates at the facility.

6. **Customer Facilities with System Impacts (Transit/Transfer Center).** For facilities that provide some benefit to multiple routes (and potentially to the entire system), future daily ridership impacted by the improvement will be estimated and then factored to account for the scale of the improvement. To account for the indirect impact on ridership, one of two factors should be utilized (per the guidance listed in previous sections): the future daily system ridership will be factored by either 10% (High Impact) or 5% (Low Impact). If project-specific ridership forecasts are available, these would be used instead of the

default approach outlined above. Average trip length will be the system average, or the average for routes that serve the transit center.

7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc.).** Future system ridership will be estimated, based on existing system ridership. To account for the indirect impact on ridership, one of two factors should be utilized (per the guidance listed in previous sections): the future daily system ridership will be factored by either 10% (High Impact) or 5% (Low Impact). Average trip length will be the system average.

8. **Technology/Information Systems**. Major investments in technology or information systems that are not part of a specific corridor, station, or facility (described above) should be scored as a systemwide improvement. Examples include customer information systems, such as real-time arrival information; operations systems, such as automatic vehicle location (AVL) systems; and administrative systems, such as fare payment or scheduling software. To account for the indirect impact on ridership, one of two factors should be utilized (per the guidance listed in previous sections): the future daily system ridership will be factored by either 10% (High Impact) or 5% (Low Impact).

3.5 Environmental Quality

Air Quality and Energy Impacts	
Objective	Potential of project to improve air quality and reduce energy use.
Definition	Expected daily VMT reduction

Methodology

Air quality and energy benefits are computed based on the estimated change in vehicle miles traveled (VMT) resulting from implementation of the proposed project. This measure is defined as the difference between the existing daily ridership and the future 2030 daily ridership attributed to the project. This accounts for both new transit trips (e.g. those who diverted from auto to transit) as well as anticipated increases in ridership due to future population and employment growth in the project area. The calculation can be generally summarized as:

VMT Reduction = (change in daily transit trips expected / average auto occupancy) * average trip length

Auto occupancy should be based on local data or else use the state average of 1.25 occupants per vehicle (work-related, 2017 NHTS). The specific approach will vary by type of project:

1. **Fixed-guideway (BRT/LRT) Corridor.** The expected change in daily VMT resulting from the project will typically be available from travel forecasts.

2. **Fleet Expansion (Systemwide).** If fleet will be used systemwide, daily transit ridership attributed to the vehicles will be estimated by calculating the current system daily ridership per vehicle in the fleet (daily passengers per vehicle). New daily ridership = vehicles added * existing daily passengers/vehicle * 10-year growth. Average trip length will be the system average.

3. **Fleet Expansion (Specific Routes).** If fleet is tied to specific routes, the daily ridership that will be served by the new vehicles for that service will be requested. If an estimate of ridership is not available, the approach outlined for systemwide improvements will be used.

4. **Customer Facilities (Station Improvements).** Project daily ridership forecasts for the station will be requested. Ridership change should be associated with the proposed improvement – for example, a new station entrance would only count the change in station ridership, not the total station ridership. For this calculation, the effected ridership for a station improvement project includes both the boardings and alightings that occur at the station. If alighting information is not available, the boardings can be doubled to yield the total daily activity for the station.

5. **Customer Facilities (Park & Ride).** For parking facilities, daily ridership will be assumed to be the number of spaces * utilization percentage * 2 (reflecting commuting inbound and outbound). Average trip length should be based on the distance from the park & ride facility to the major destination (such as the CBD) for service that originates at the facility.

6. **Customer Facilities with System Impacts (Transit/Transfer Center).** For facilities that provide some benefit to multiple routes (and potentially to the entire system), future daily ridership impacted by the improvement will be estimated and then factored to account for the scale of the improvement. To account for the indirect impact on ridership, one of two factors should be utilized (per the guidance listed in previous sections): the change in daily system ridership will be factored by either 10% (High Impact) or 5% (Low Impact). If project-specific ridership forecasts are available, these would be used instead of the default approach outlined above.

7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc.).** Future daily system ridership will be estimated, based on existing system ridership. To account for the indirect impact on ridership, one of two factors should be utilized (per the guidance listed in previous sections): the change in daily system ridership will be factored by either 10% (High Impact) or 5% (Low Impact). If the maintenance facility directly supports the addition of new service, the expected daily ridership added on the new routes will be used instead. Average trip length will be the system average.

8. **Technology/Information Systems**. Major investments in technology or information systems that are not part of a specific corridor, station, or facility (described above) should be scored as a systemwide improvement. Examples include customer information systems, such as real-time arrival information; operations systems, such as automatic vehicle location (AVL) systems; and administrative systems, such as fare payment or scheduling software. To account for the indirect impact on ridership, one of two factors should be utilized (per the guidance listed in previous sections): the change in daily system ridership will be factored by either 10% (High Impact) or 5% (Low Impact).

Scoring Value

Project expected daily VMT reduction

3.6 Land Use

Expected Safety Benefit

Objective	Evaluate the transit-supportive land use that will be served by the transit improvement
Definition	Future density plus the change in density expected in the project corridor

Methodology

To calculate activity density, land use data will be compiled for an area around the project. The data source will be the Virginia statewide travel demand model land use inputs. The population and job totals for each traffic zone (TAZ) are factored based on the portion of the TAZ area that falls within the project buffer. The projected future employment for the horizon year will be added to the projected future population for the horizon year, the sum is then divided by the acres within the buffered area. Consistent with SMART SCALE, the land use measure will be an average of the future activity density and the change in activity density:

- 50 percent based on Future Activity Density = projected 2030 employment + projected 2030 population/ acres within the buffered area.
- 50 percent based on Change in Activity Density = Growth in Density (2030 Density—Existing Density).

The calculation of land use will be based on a project buffer that varies by project type:

1. **Fixed-guideway (BRT/LRT) Corridor.** The project buffer is defined as areas with ½ mile walking distance of the BRT or LRT line The population and employment density within the buffer will be calculated.
2. **Fleet Expansion (Systemwide).** For systemwide fleet expansion, the areas within ½ mile walking distance of all system routes will be included in the project buffer. The population and employment density within the buffer will be calculated.
3. **Fleet Expansion (Specific Routes).** For fleet expansion that serves specific routes, the areas within ½ mile walking distance of the specific routes will be included in the project buffer. The population and employment density within the buffer will be calculated.
4. **Customer Facilities (Station Improvements).** The project buffer is defined as areas within ½ mile walking distance of the station. The population and employment density within the buffer will be calculated.
5. **Customer Facilities (Park & Ride).** The project buffer is defined as areas within a 5-mile distance of the Park & Ride facility. The population and employment density within the buffer will be calculated.
6. **Customer Facilities with System Impacts (Transit/Transfer Center).** For customer facilities serving a large portion of the system routes, the areas within ½ mile walking distance of all supported routes will be included in the project buffer. The population and employment density within the buffer will be calculated.
7. **Construction of Operational Facility (Admin/Maintenance facilities, bus parking, etc).** For operational facilities, the areas within ½ mile walking distance of all system routes will be included in the project buffer. The population and employment density within the buffer will be calculated.

Scoring Value

Average of the future activity density (population + employment) and the change in activity density within a designated buffer area of the project

3.7 Calculating Benefit Score

Step 1. Within each of the measures identified for each of the six scoring factors, the raw measure value is normalized against a maximum value for that measure (putting each number on a 0-100 scale). Maximum values have been set based on actual projects in Virginia (see table below). The advantage of setting a maximum value, rather than using the highest value submitted for each application year (as is done for SMART SCALE), is that it provides consistency and allows scores to be compared from year-to-year. This is especially beneficial if there are a relatively small number of applications received in any one year.

Step 2. Once each normalized measure value has been established for the measure, the measure weighting is applied. Each measure within the six factor areas has a measure weight assigned that determines the importance in the score each measure contributes. Note that for project sponsors located in Category C or D areas, the land use factor score will not be calculated or utilized in the combined score. Once the measure weighting has been applied, the sum of the weighted normalized measure values produces the scoring value for that criteria.

Maximum Value by Measure

Factor	Measure	Maximum Value (= 100 points) for Normalization
Congestion Mitigation	Increase in Peak-period Ridership Attributed to the Project	4,000
Economic Development	Project Support for Economic Development (Scaled by Change in Jobs)	81,000
Accessibility	Project Improvement in Accessibility to Jobs, Workforce Development, and Non-Work Destinations	950,000
	Disadvantaged population (low-income, minority, or limited English proficiency) Accessibility	175,800
Safety	Project Contribution to Improving Safety and Security (Scaled by Transit Person Miles Traveled)	615,100
Environmental Quality	Reduction in Daily Vehicle Miles Traveled Resulting from Project	38,550
Land Use	Average of future density and the change in density expected in the project corridor	65

Step 3. The weighted measure scores are multiplied by the factor weights that were presented in Table 3.2 according to the four MPO and PDC area types shown in Figure 3.1. The sum of the weighted factor scores becomes the total Benefit Score for the project.

Step 4. The Benefit Score is divided by the state's contribution to the cost of the project in $10 millions of dollars to get the Score per Cost used for the final ranking of projects.

4.0 Data from Agencies

Data needed for SGR, MIN, and MAJ project applications, for each prioritization factor, are identified in Table 4.1, Table 4.2, and Table 4.3.

Table 4.1 SGR Data Requirements

Evaluation Criteria	Measure	Data Source	Applicant Responsibility
Asset Condition	Asset Age	TransAM	Yes (update TransAM)
	Vehicle Mileage	TransAM	Yes (update TransAM)

Table 4.2 Service Impact (SGR and MIN) Data Requirements

Evaluation Criteria	Measure	Data Source	Applicant Responsibility
Service Frequency, Travel Time, and Reliability	On-Time Performance	National Transit Database or agency-reported	Yes
	Vehicle Mean Distance Between Failures	National Transit Database or agency-reported	Yes
Operating Efficiency	LEED Maintenance Facility	LEED Certificate	Yes
	Electric or Hybrid Technology	Vehicle information	Yes
	Agency Spare Ratio	National Transit Database or agency-reported	Yes
Service Accessibility and/or Customer Experience	New Stops or Expanded Service	Map and description of expanded stops and/or routes	Yes
	Software/Hardware to Provide Real-Time Arrival Information	Description of the system/improvement	Yes
Safety and Security	Onboard technology to enhance passenger safety	Description of the system/improvement	Yes
	Lighting or Other Crime Prevention	Description of the system/improvement	Yes
	Pedestrian Safety Improvements	Description of the improvements and a map of improvement locations	Yes

Table 4.3 MAJ Data Requirements

Evaluation Criteria	Measure	Data Source	Applicant Responsibility
n/a	Project map / shape files	GIS shape files for the project – corridor/line, station, facility location, and any bus routes supported by the project.	Yes—Provide map and description of the project location
Congestion Mitigation	10-year forecast (2030) for Daily and a.m. (3-hour) peak-period ridership	Project forecasts	Yes
	Existing Passengers Per Vehicle (Fleet Expansion only)	Daily or peak-period Passengers per available fleet vehicle	Fleet Expansion only
	Number of parking spaces (Park & Ride only)	For Park & Ride facilities, applicant should provide number of spaces being added for facility	Park & Ride only
Economic Development	Comprehensive Plan, Economic Development Strategy, or Regional Economic Development Strategy	Local Planning Office, Economic Development Office, or Regional Council of Governments Economic Development Office	Yes
	Project Located in Areas of Economic Distress	Economic Innovation Group's Distressed Communities Index by ZIP Codes	Yes—Provide map and description of the project location
	Transit-Supportive Policies: local jurisdiction plans and policies	Local Planning Office, Economic Development Office, Transportation Office, or Regional Council of Governments Office	Yes—Provide description
	Supportive Zoning Near Transit	Local Planning Office or Zoning Office	Yes—Provide description
	Change in Jobs Near Project	Statewide Travel Model—Land Use Inputs	No
Accessibility	Access to Jobs (current and 2030 forecasted data)	Statewide Travel Model—Land Use Inputs	No
	Access to Disadvantaged Communities (current and 2030 forecasted data)	U.S. Census Data	No
	Estimated Travel Time Improvement, due to the project	Project forecasts or estimates from local agencies	Yes–Provide estimate
Safety	Asset-Condition Related Safety Improvements	Description of Improvements and Increase in Safety	Yes
	Technology-Related Safety Improvements	Description of Improvements and Increase in Safety	Yes
	Customer-Facility Safety Improvements	Description of Improvements and Increase in Safety	Yes
	Safety or Emergency Response Projects	Description of Improvements	Yes
	Person miles traveled due to transit project	Expected daily ridership on the project and average trip length for users	Yes
Environmental Quality	Vehicle Miles Traveled Change Due to Project	Project forecasts, if available (2030 forecasts)	Yes
	Vehicle Miles Traveled Change Due to Project (Estimated)	Share of project trips that shifted from auto Avg. trip length	Yes

Evaluation Criteria	Measure	Data Source	Applicant Responsibility
		Avg. auto occupancy	
Land Use	Employment (current and 2030 forecasted)	Statewide Travel Model—Land Use Inputs	No
	Population (current and 2030 forecasted)	Statewide Travel Model—Land Use Inputs	No
	Acres within the Project Area	GIS Shapefiles of the project and area	Yes—Provide map and description of the project location